The able author has brought to the task not only his former experiences of African fishes—north and south, east and west—but the whole resources of the British Museum, and the vast storehouse of information amassed during the lifelong labours of Dr. Günther, and he has accomplished it in a manner creditable to the Egyptian Government, to science, and to himself. His work, indeed, will long form the basis of future labours in the ichthyology of the Nile. The whole of the families are as admirably illustrated as described in the beautiful volume of lifelike lithographs by Messrs. Smit and Green, their work rivalling the exquisite finish of the late G. H. Ford, long *facile princeps* in the department. Finally, if any suggestion may be made in a work so carefully performed, it is that in the index the synonyms might have been printed in italics, and that, in the text, plate xiv. should be substituted on p. 84 for plate xv. W. C. M.

SOME RECENT PAPERS ON METEORITES.

WE have before us a number of reprints of recent papers descriptive of various meteorites. Several of these are by the late Dr. Henry A. Ward and the late Prof. E. Cohen, two of the most indefatigable workers in this subject, whose loss is much to be deplored. In 1904, two years before his death, Dr. Ward published a "Catalogue of the Ward-Coonley Collection of Meteorites," which is not only a catalogue, but contains, in addition, much useful information, including alphabetical and topographical lists of all known meteorites (about 680 in number). The Ward-Coolney collection, now exhibited in the American Museum of Natural History at New York, is one of the most complete that has ever been made, containing as it does representatives of 603 meteoritic falls; it is further remarkable in that it was brought together in the comparatively short space of time of ten years. Prof. Cohen died in 1905, and a third part of his "Meteoreisenkunde" was published after his death; this, which is the only general work that has yet been attempted on meteorites, unfortunately remains incomplete.

Dr. H. A. Ward (Proc. Rochester Acad. Sci., 1904, vol. iv., pp. 137–148, with 6 plates) gives a description of the Willamette meteorite, which was found in 1902 near the town of Willamette, in Oregon. This mass of metallic nickel-iron measures $10 \times 6\frac{1}{2} \times 4\frac{1}{4}$ feet, and weighs 31,107 lb. (about $15\frac{1}{2}$ tons); it is the third largest meteorite as yet known. Like the largest on record, the Anighito, of $36\frac{1}{2}$ tons, brought by Commander R. E. Peary from Cape York, in Greenland, it is now exhibited in the American Museum of Natural History. The second largest known meteorite is that of Bacubirito, in Mexico, which has an estimated weight of $27\frac{1}{2}$ tons; this mass, though unearthed and described by Dr. Ward in 1902, has not been removed from the place where it was found. The Willamette meteorite is roughly conical in form, and it was found embedded in the ground with the base of the cone uppermost, suggesting that the apex of the cone was to the front of the falling meteor. The mass is remarkable for the deep, rounded, and cylindrical pits, of which several types are distinguished, on the sides and the base of the cone. The deep cavities on the base (Fig. 1) are accounted for by the weathering and rusting action of water standing in pools on the exposed part of the mass as it lay for unknown ages in the soil of the primeval forest of a very moist region. The pittings and groovings on the sides are attributed by the author to the erosive action of the air during the flight of the meteorite; but it seems more likely that they have been produced by weathering in the ground, and that none of the original surface now remains. The nodules and rods of troilite (iron sulphide) enclosed in the metallic iron no doubt formed the centres around which the weathering has proceeded. The Widmanstätten figures on an etched section of the iron show the structure to be octahedral with broad lamellæ. The specific gravity of the iron is 7·7, and it contains $91\frac{1}{2}$ per cent. of iron, 8 per cent. of nickel, and small amounts of cobalt and phosphorus.

Dr. H. A. Ward (*ibid.*, 1905, vol. iv., pp. 193–202) also gives an account of the Bath Furnace aërolite,

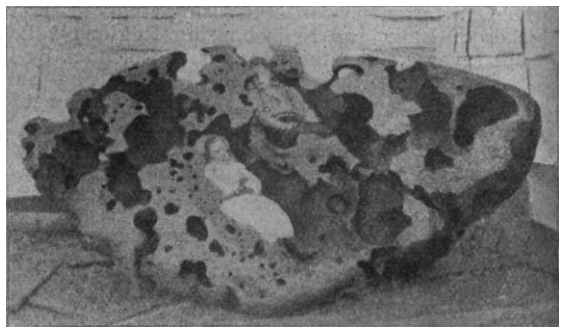

FIG. 1.—Willamette Meteorite. Full view, lower side of meteorite.

which was observed to fall on November 15, 1902, in the vicinity of Bath Furnace in Bath co., Kentucky, the fall being accompanied by a blinding light, loud detonations, and hissing noises. In all, three stones were found; one of them, weighing nearly 13 lb., struck the hard surface of a road, making an east to west furrow about a foot in length and five inches in greatest depth. Another mass of $177\frac{1}{4}$ lb. fell $1\frac{3}{4}$ miles further south; it scarred the trunk of one tree, cut through the roots of another, and buried itself two feet in the ground. A side view (Fig. 2) of this larger

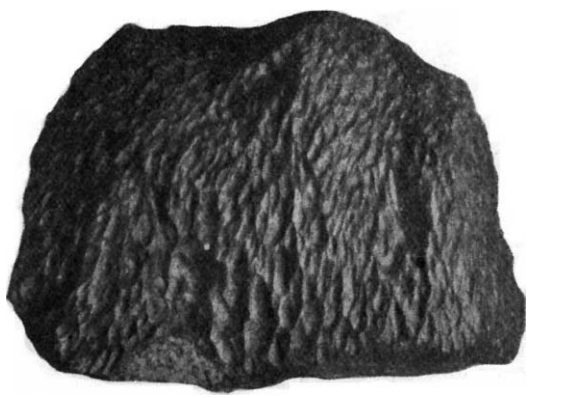

FIG. 2.—Bath Furnace Meteorite. Side view, showing furrows radiating from apex.

stone shows very clearly a system of furrows radiating from the apex, which were produced by the intense erosive action of the air during the flight of the stone. The internal structure of the Bath Furnace meteorite is that of a spheroidal chondrodite like that of the three previously known meteorites (Werchne Tschirskaja, South Russia, 1843; Trenzano, Italy, 1856; and Saline Township, Kansas, 1898), which fell during the November Leonids. Both the Bath Furnace and the Willamette meteorites gave rise to suits at law between the finders and the land owners. In other papers, Dr. Ward describes some new Chilian

meteorites, and also gives general notes on the history of meteorites and collections of meteorites, especially as regards the aims of the latter.

Prof. E. Cohen (Ann. S. African Museum, 1906, vol. v., pp. 1–16, with 3 plates), describes the meteoric stone of 30½ lb. which was observed to fall on January 3, 1903, at the mission station of St. Mark's, in Transkei, Cape Colony. The description of the microscopical structure and chemical composition of this stone was completed by Prof. C. Klein, another well-known worker on meteorites, who also died recently (1907).

Mr. L. L. Fermor (Records Geol. Survey India, 1907, vol. xxxv., pp. 79–96, with 12 plates) collects together information respecting the circumstances of the fall of various Indian meteorites, and gives brief notes on their external characters. At greater length (*ibid.*, pp. 68–78, with 3 plates) he describes the fall of stones near Dokachi, in Bengal, on October 22, 1903; here, along a line six miles in length, twenty-four fragments, with a total weight of 3838 grams, were picked up. A list is given of seventy-one meteoritic falls recorded in India since 1798; more records exist in later years, and in the more thickly populated districts, and latterly they have averaged one each year. All, except three, of these Indian meteorites are composed of stony material.

Prof. O. C. Farrington (Field Columbian Museum, Geol. Ser., 1907, vol. iii., pp. 57–110) collects together 360 published analyses of 248 meteoric irons, tabulating them in different classes according to the structure of the iron. It is then seen that there exists a close relationship between chemical composition and structure. All irons with a hexahedral structure are very uniform in composition (94·12 per cent. Fe), whilst in those with an octahedral structure the amount of nickel increases with the fineness of the lamellæ. In the ataxite group, in which the structure is finely granular to compact, there is more variation in composition. The average composition of all meteoric irons is approximately Fe, 90; Ni, 9; Co, 0·9; Cu, 0·02 per cent. The same author also describes in detail in the same journal the siderite of Rodeo, Mexico (found 1852), the siderolite of South Bend, Indiana (found 1893), and the aërolite of Shelburne, Ontario (fell August 13, 1904).

The papers on meteorites noted above are but a few selected at random from the many that have been recently published: except in details, one paper is, however, more or less a repetition of another.

L. J. S.

NOTES.

THE president and council of the Royal Society have recommended the following fellows for election as members of the council for the ensuing year at the anniversary meeting on November 30:—*President*, Lord Rayleigh, O.M.; *treasurer*, Mr. A. B. Kempe; *secretaries*, Prof. J. Larmor, Sir Archibald Geikie, K.C.B.; *foreign secretary*, Prof. J. R. Bradford; *other members of council*, Dr. H. F. Baker, the Right Hon. A. J. Balfour, Sir William Crookes, Mr. Francis Darwin, Sir George Darwin, K.C.B., Prof. J. C. Ewart, Prof. D. Ferrier, Mr. C. T. Heycock, Prof. S. J. Hickson, Prof. J. Joly, the Hon. C. A. Parsons, Dr. A. Scott, Prof. A. C. Seward, Prof. F. T. Trouton, Dr. A. D. Waller, Mr. W. Whitaker.

THE late Dr. Edward Sang's collection of MS. calculations in trigonometry and astronomy has been gifted to the British nation by the Misses Sang, and the president and council of the Royal Society of Edinburgh have been appointed custodiers of the collection, with power to publish such parts as may be judged useful to the scientific world. The society has also been given custody of the duplicate electrotype plates of Dr. Sang's 1871 new seven-place table of logarithms to 200,000, with power to use them for reproducing new editions, or publishing extended tables of seven-place logarithms. At the meeting of the society on November 4, the chairman, Dr. R. H. Traquair, F.R.S., read a statement regarding Dr. Sang's monumental work. The manuscript volumes number forty-seven in all, the contents of thirty-two of which are in transfer duplicate. Vols. i. to iii. contain the details of the steps of the calculations on which the results contained in the next thirty-six volumes are based. Vol. iv. contains the logarithms, calculated to twenty-eight figures, of the prime numbers up to 10,000, and a few beyond. Vols. v. and vi. contain the logarithms to twenty-eight figures of all numbers up to 20,000. From these the succeeding thirty-two volumes are constructed, giving the logarithms to fifteen places of all numbers from 100,000 to 370,000. This colossal work must ever remain of the greatest value to computers of logarithmic tables. It is a great national possession. The other tables in the collection are trigonometrical and astronomical. Of special interest are the tables of sines and tangents calculated according to the centesimal division of the quadrant. It is hoped that ere long some of these tables may be published in such a form as to make them more immediately accessible to computers. They are the foundation of Dr. Sang's published book of seven-place logarithms to 200,000, undoubtedly the most perfect of its kind ever printed. The complete account of the various tables will be printed in the society's Proceedings, and other scientific bodies will have their attention directed to the importance of the collection now in the custody of the society.

THE Huxley memorial medal of the Royal Anthropological Institute was presented to Prof. E. B. Tylor, F.R.S., on Tuesday, November 5, in recognition of his distinguished services to anthropology. On October 2 Prof. Tylor celebrated his seventy-fifth birthday, and the anniversary was made the occasion of the presentation to him of a volume of essays representative of British anthropology. The current volume of the Journal of the Royal Anthropological Institute is dedicated to Prof. Tylor; and the presentation of the Huxley memorial medal is another mark of the esteem in which he is held by anthropologists.

SIR OLIVER LODGE has accepted the invitation of the council of the Faraday Society to succeed the late Sir William Perkin as president of the society.

ON October 20 the Paris newspaper *l'Eclair* liberated 10,000 pilot balloons from a boat on the Seine. One of these balloons was found at mid-day on October 21 at Undermannlaani, near Kausala, which is on the railway mid-way between Helsingfors and Wiborg, in Finland. The distance is 1950 kilometres. The balloon was found twenty hours after the start, and, assuming that it had only just fallen, the average rate was nearly 100 kilometres per hour. The lift of the balloons, including weight of postcard, &c., was supposed to be about 1 gram, but departures from this value must have been frequent, for Mr. Charles J. P. Cave, who witnessed the ascents and sends us these particulars of them, states that the rates of ascent of different balloons varied greatly. The diameter of the balloons was about 35 centimetres. The greatest distance covered by a manned balloon is 1925 kilometres, in the ascent of Count de la Vaulx from Vincennes on October 9, 1900.